

Atty. Docket No. CPAC 1029-3
Appl. No. 10/681,735

PATENT

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (original) A multipackagc module having a second package inverted and stacked over a first package, each said package comprising a die attached to a substrate, the second package substrate and the first package substrate being interconnected by wire bonding, wherein the first package comprises a ball grid array package.
2. (original) The multipackage module of claim 1 wherein at least one said package has wire bond interconnect of the die with the substrate, and the said wire bonded package is at least partly encapsulated.
3. (original) The multipackage module of claim 1 wherein the inverted second package has wire bond interconnect of the die with the substrate.
4. (original) The multipackage module of claim 3 wherein the inverted second package is at least partially encapsulated.
5. (original) The multipackage module of claim 1 wherein the inverted second package is a land grid array package.
6. (original) The multipackage module of claim 1 wherein the second package substrate is a bump chip carrier type package substrate.
7. (original) The multipackage module of claim 1, further comprising a heat spreader having a generally planar upper surface exposed at the top of the module.
8. (original) The multipackage module of claim 7 wherein a planar part of the heat spreader is supported by support members over the first package substrate.

Atty. Docket No. CPAC 1029-3
Appl. No. 10/681,735

PATENT

9. (original) The multipackage module of claim 7 wherein a planar part of the heat spreader is affixed onto an upward facing surface of the inverted second package.

10. (original) The multipackage module of claim 1, further comprising an electromagnetic shield for at least one of the packages.

11. (original) The multipackage module of claim 1, further comprising an electromagnetic shield for the first package.

12. (original) The multipackage module of claim 11 wherein the inverted second package is affixed onto an upper surface of the electromagnetic shield.

13. (original) A method for making a multipackage module, comprising
providing a BGA first package comprising a first package substrate,
providing a second package comprising a second package substrate,
inverting the second package and stacking the inverted second package over the first package, and
electrically interconnecting the first and second package by wire bonds connecting the first and second substrates.

14. (original) The method of claim 13, said BGA first package being a molded package, the molding having a generally planar upper surface, wherein stacking the inverted second package over the first package comprises applying an adhesive onto the molding upper surface and placing the inverted second package onto the adhesive.

15. (original) The method of claim 14 wherein the adhesive is a curable adhesive, and further comprising curing the adhesive.

Atty. Docket No. CPAC 1029-3
Appl. No. 10/681,735

PATENT

16. (original) The method of claim 13 wherein providing the BGA first package comprises providing an unsingulated strip of BGA packages.
17. (original) The method of claim 13 where providing the BGA first package comprises testing BGA packages for a performance and reliability requirement and identifying the said first package as meeting the requirement.
18. (original) The method of claim 13 where providing the second package comprises testing packages for a performance and reliability requirement and identifying the said second package as meeting the requirement.
19. (original) The method of claim 13, further comprising attaching second-level interconnect balls onto the BGA first package substrate.
20. (original) The method of claim 13, further comprising encapsulating the stacked packages in a multipackage module molding.
21. (original) The method of claim 13, further comprising singulating the modules.
22. (original) The method of claim 13 wherein providing the second package comprises providing a land grid array package.
23. (original) The method of claim 13 wherein providing the second package comprises providing a land grid array package, the land grid array package being at least partially molded.
24. (original) The method of claim 23, the land grid array package being fully molded.
25. (original) The method of claim 23, the wire bonds of the land grid array package being molded, and at least a portion of an upward facing surface of an upper die being exposed.

Atty. Docket No. CPAC 1029-3
Appl. No. 10/681,735

PATENT

26. (original) The method of claim 13 wherein the BGA first package is provided with an electromagnetic shield affixed over the die.
27. (original) The method of claim 26, the shield having a generally planar upper surface, wherein stacking the inverted second package over the first package comprises applying an adhesive onto the shield upper surface and placing the inverted second package onto the adhesive.
28. (original) The method of claim 27 wherein the adhesive is a curable adhesive, and further comprising curing the adhesive.
29. (original) The method of claim 13, further comprising providing a heat spreader.
30. (original) The method of claim 29, wherein providing a heat spreader comprises carrying out a drop-in mold operation, the heat spreader being placed into a mold prior to forming a module molding.
31. (original) The method of claim 29, wherein providing a heat spreader comprises affixing a generally planar portion of a heat spreader onto a generally planar upward facing surface of the inverted second package.